

WHAT IS CLAIMED IS:

1. A method of evaluating restitution characteristics of a golf club head by performing impact vibration through application of an external force to a golf ball impact surface of the golf club head, the method comprising:

acquiring a resonance frequency of the impact surface in a mass added state, which is obtained by affixing a mass regulating member having a known mass to the impact surface, and acquiring a resonance frequency of the impact surface in a non-mass added state, in which the mass regulating member is not affixed to the impact surface, by using a response signal of the impact surface due to the impact vibration; and

computing, by using the resonance frequency obtained in the mass added state and the resonance frequency in the non-mass added state, a coefficient of restitution for the impact surface when the impact surface impacts a golf ball.

2. The method of evaluating restitution characteristics of a golf club head according to claim 1, further comprising, when computing the coefficient of restitution, obtaining a parameter that specifies the resonance frequency of the impact surface in the non-mass

added state, in which the mass regulating member is not affixed to the impact surface, and computing the coefficient of restitution of the impact surface when the impact surface impacts a golf ball by using the parameter.

3. The method of evaluating restitution characteristics of a golf club head according to claims 1, wherein the resonance frequency is a first resonance frequency of the impact surface.

4. The method of evaluating restitution characteristics of a golf club head according to claim 2, wherein the parameter is a modal parameter of a resonance mode of the impact surface.

5. The method of evaluating restitution characteristics of a golf club head according to claim 4, further comprising, when computing the coefficient of restitution, obtaining a modal parameter, the modal parameter being one of a modal mass and a modal stiffness, and using the modal parameter to compute the coefficient of restitution.

6. The method of evaluating restitution

characteristics of a golf club head according to claims 3, wherein the response signal is an acceleration signal of vibrations of the impact surface.

7. The method of evaluating restitution characteristics of a golf club head according to claim 6, further comprising: performing the impact vibration by applying the external force at plural points that are distributed on the impact surface; obtaining, for each of the points, a transfer function for an acceleration signal with respect to the external force; and acquiring as the first resonance frequency of the impact surface a peak frequency at which a peak forms in an identical phase in each obtained transfer function.

8. The method of evaluating restitution characteristics of a golf club head according to claim 1, wherein the response signal is a sound pressure signal of the impact surface.

9. A method of evaluating restitution characteristics of a golf club head by performing impact vibration through application of an external force to a golf ball impact surface of the golf club head, the method comprising:

acquiring resonance frequencies of the impact surface in a plurality of mass-added states, which are obtained by affixing respectively a plurality of mass regulating members having known, mutually differing masses to the impact surface, by using a response signal of the impact surface due to the impact vibration; and

computing, by using the resonance frequencies acquired in a plurality of mass-added states, a coefficient of restitution for the impact surface when the impact surface impacts a golf ball.

10. The method of evaluating restitution characteristics of a golf club head according to claim 9, further comprising, when computing the coefficient of restitution, obtaining a parameter that specifies the resonance frequency of the impact surface in the non-mass added state, in which the mass regulating member is not affixed to the impact surface, and computing the coefficient of restitution of the impact surface when the impact surface impacts a golf ball by using the parameter.

11. The method of evaluating restitution characteristics of a golf club head according to claims 9, wherein the resonance frequency is a first resonance

frequency of the impact surface.

12. The method of evaluating restitution characteristics of a golf club head according to claim 10, wherein the parameter is a modal parameter of a resonance mode of the impact surface.

13. The method of evaluating restitution characteristics of a golf club head according to claim 12, further comprising, when computing the coefficient of restitution, obtaining a modal parameter, the modal parameter being one of a modal mass and a modal stiffness, and using the modal parameter to compute the coefficient of restitution.

14. The method of evaluating restitution characteristics of a golf club head according to claim 12, wherein the response signal is an acceleration signal of vibrations of the impact surface.

15. The method of evaluating restitution characteristics of a golf club head according to claim 14, further comprising: performing the impact vibration by applying the external force at plural points that are

distributed on the impact surface; obtaining, for each of the points, a transfer function for an acceleration signal with respect to the external force; and acquiring as the first resonance frequency of the impact surface a peak frequency at which a peak forms in an identical phase in each obtained transfer function.

16. The method of evaluating restitution characteristics of a golf club head according to claims 9, wherein the response signal is a sound pressure signal of vibrations of the impact surface.

17. A device for evaluating restitution characteristics of a golf club head, the device evaluating the restitution characteristics of the golf club head by using a response signal of a golf ball impact surface of a golf club when impact vibration is performed on the impact surface by applying an external force to the impact surface, the device comprising:

a resonance frequency computing portion that acquires a resonance frequency of the impact surface in a mass added state, which is obtained by affixing a mass regulating member having a known mass to the impact surface, and a resonance frequency of the impact surface in a non-mass

added state, in which the mass regulating member is not affixed to the impact surface, by using a response signal of the impact surface due to the impact vibration; and

a restitution coefficient computing portion that obtains, by using the resonance frequency in the mass added state and the resonance frequency in the non-mass added state, a coefficient of restitution for the impact surface when the impact surface is impacted by the golf ball.

18. A device for evaluating restitution characteristics of a golf club head, the device evaluating the restitution characteristics of the golf club head by using a response signal of a golf ball impact surface of a golf club when impact vibration is performed on the impact surface by applying an external force to the impact surface, the device comprising:

a resonance frequency computing portion that acquires resonance frequencies of the impact surface by using a response signal of the impact surface due to the impact vibration, with the impact surface in a plurality of mass-added states which are obtained by affixing respectively a plurality of mass regulating members having known, mutually differing masses to the impact surface; and

a restitution coefficient computing portion that

obtains, by using the resonance frequencies acquired, a coefficient of restitution for the impact surface when the impact surface is impacted by the golf ball.